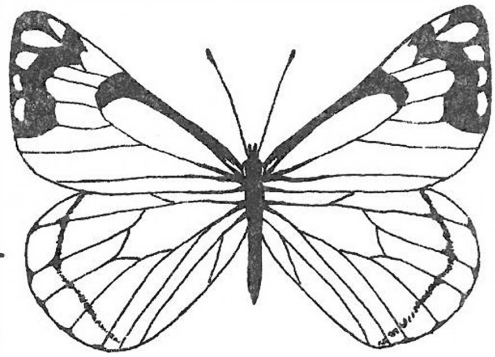
MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

DIVISION OF FORESTRY

INSECT AND DISEASE REPORT



Missoula, Montana 59801
Report 77-3

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February, 1977

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CARLSON
DOOLING
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OAKES
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MEYER
TUNNOCK
DRAKE

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FOREST INSECT CONDITIONS

IN MONTANA - 1976

By

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Cooperative Forest Management
Division of Forestry

Insects, as well as diseases, are significantly diminishing the forests of Montana. The most recent estimates indicate that approximately 164 million cubic feet of timber are killed annually from various causes on commercial forest lands in Montana.1/ The largest percentage of this mortality is caused by insects and diseases.

Insects and diseases also cause serious reduction in growth of trees attacked but not killed. In addition to growth loss, insect attacks may result in top kill or deformities which reduce the quality of timber resources. Seed and cone insects also destroy the seed crops necessary for reforestation of logged or burned areas.

1/ Green, A.W., and T.S. Setzer. 1974. The Rocky Mountain Timber Situation, 1970. USDA Forest Service Resource Bull. INT-10

THE CONTROL PROGRAM

There is great opportunity for increasing timber production and for preserving forests for recreational and aesthetic uses by reducing damage and losses caused by forest pests. Under the Insect and Disease Control Program, responsibilities of the Division of Forestry of the Department of Natural Resources and Conservation, fall into four basic areas:

1. Encouraging the use of preventive measures of demonstrated effectiveness on State and private forest lands as the first line of defense against destructive insects and diseases.

2. Operating a detection program with surveys of sufficient intensity and frequency to insure prompt discovery of forest insect and disease outbreaks on State and private lands.

3. Providing for thorough biological, cost-benefit, and environmental impact evaluations of insect and disease outbreaks on State and private forest lands as a basis for deciding for or against suppression.

4. Practicing and encouraging the use of effective means of forest insect and disease control which provide the least potential hazard to man, domestic animals, wildlife and other components of the natural environment.

PROGRAM ACCOMPLISHMENTS

Some of the surveys and evaluations made during 1976 were:

1. The annual cooperative aerial insect and disease detection survey was conducted on a total of 2,927,200 acres of forest lands. Blocks of forest land flown by the Division of Forestry contained the bulk of State and private commercial ownerships, including the Swan River, Stillwater and Thompson River State Forests. Insect and disease infestations were mapped and copies of completed maps made available to the U. S. Forest Service and the Division of Forestry Administrative Areas.

2. A total of 37 field detection reports and damage samples were received from Division field personnel and private landowners for identification and recommendations.

3. An evaluation of street and park trees was conducted for the city of Great Falls. Insect and disease problems were identified and recommendations made for control and preventive tree maintenance.

4. To determine the distribution of Douglasfir tussock moth in Montana, a survey began in 1975 was continued using sticky traps baited with sex attractant to trap male moths. In 1976,

traps with stronger baits were placed at 43 additional locations, chiefly east of the Continental Divide. Male Douglasfir tussock moths were trapped at two locations east of the Continental Divide, and at six additional locations west of the Divide.

5. A study to determine the effectiveness of cacodylic acid herbicide as an agent causing mountain pine beetle brood mortality in treated trees was continued for a second year in the Little Snowy Mountains south of Lewistown. Beetles were again attracted to trees baited with pheromone attractant. Both pre and post-flight applications of the herbicide were made, and the effects on beetle brood mortality will be assessed in the spring of 1977 and compared to the previous year's results.

6. Four insecticides (Sevin, Orthene, Pyrocide Growers Spray and Dimilin) were tested against Douglasfir tussock moth and western spruce budworm larvae on Douglasfir near St. Ignatius in June. Hydraulic ground spray equipment was used to apply the insecticides and all treatments were highly successful.

REVIEW OF CONDITIONS

Bark Beetles

MOUNTAIN PINE BEETLE, Dendroctonus ponderosae (Hopk.)

Infestation levels continued to increase in many areas of overstocked second-growth ponderosa pine stands and mature lodgepole pine stands in the State (Figure 1). Mortality in lodgepole pine continued in the Gallatin River drainage south of Bozeman. A volume approaching two million board feet was killed in 1976 within the infestation, which now covers more than 5,500 acres of Federal and private lands. Scattered groups of infested lodgepole pine increased north of West Yellowstone and in the Hebgen Lake area. Additional heavy losses are expected to occur in the Gallatin Canyon during 1977.

THIS IS A LITTLE LOW

Heavy losses in lodgepole pine occurred again on 6,000 acres of U. S. Plywood, Burlington Northern, State and Federal lands in the Meadow and Lazier Creek drainages north of Thompson Falls, despite salvage operations to remove dead and infested trees. Increased activity was detected near Fish Trap Lake, along the Thompson River and in the Twin Lakes Creek and Fish Trap Creek drainages. Several hundred additional trees were killed.

Approximately 500 ponderosa pines were killed in the Cameron Creek drainage near Sula. Scattered ponderosa pines were killed along the west side of the Bitterroot Valley between Florence and Hamilton. About 1,000 trees were killed between the forks of the Bitterroot River near Conner. The outbreak which started in 1974 in Jack Creek east of Ennis, continued to spread in 1976, and now covers approximately 2,500 acres. An additional 500 lodgepole pines were killed on the Hidden Lake Bench and in the Cliff and Wade Lakes areas.

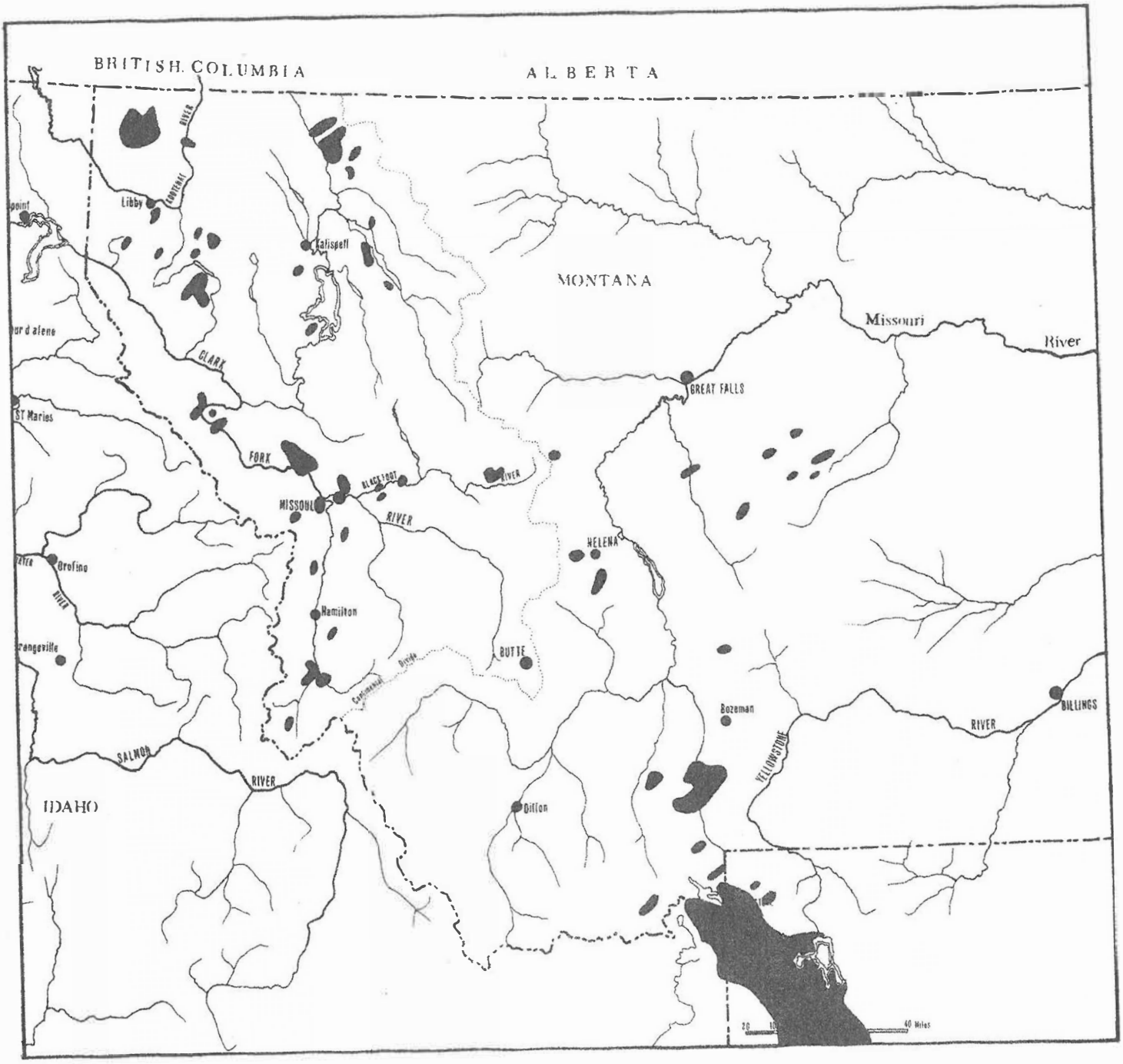


Figure 1. Areas of mountain pine beetle infestation, Montana, 1976.

Despite efforts of control through removal of infested trees, mountain pine beetle activity in ponderosa and lodgepole pines persisted on State, private and Federal lands and in the Park Creek drainage and Lincoln Gulch areas near Lincoln. Over 200 additional ponderosa pines were killed in the McClellan Creek drainage southeast of Helena.

More than 50,000 lodgepole pines were killed in 1976 in the Upper Yaak River drainage north of Libby. The outbreak now affects about 5,200 acres of predominantly U. S. Forest Service lands.

Continued killing of ponderosa pines by mountain pine beetle occurred on State, private and Federal lands in the Lewistown area. In the Moccasin Mountains, several groups totalling approximately 150 trees were detected. Several hundred additional trees were killed in the Judith Mountains. Activity continued to increase in the Casino, Beaver, Rock, Castle and Big Spring Creek drainages of the Big Snowy Mountains. Some scattered groups of dead ponderosa pine were also detected on the south end of the Big Snowy Mountains. Several hundred trees were killed in the McCartney and Flatwillow Creek drainages and other areas in the Little Snowy Mountains. Activity in scattered groups occurred over a wide area.

Mountain pine beetle infestation in scattered groups of trees continued along the Blackfoot River between Rainbow Bend and Whitaker Bridge. Approximately 400 ponderosa pines were killed north of Potomac. In the Fish Creek and Little Fish Creek drainages east of Greenough, losses were heavy over approximately 1,000 acres of private lands. Scattered groups of ponderosa pines were again killed along the Clark Fork between Bonita and Bearmouth. Continued losses in the Johnson and Butler Creek drainages northwest of Missoula were incurred and efforts are now underway to salvage dead and infested ponderosa pines.

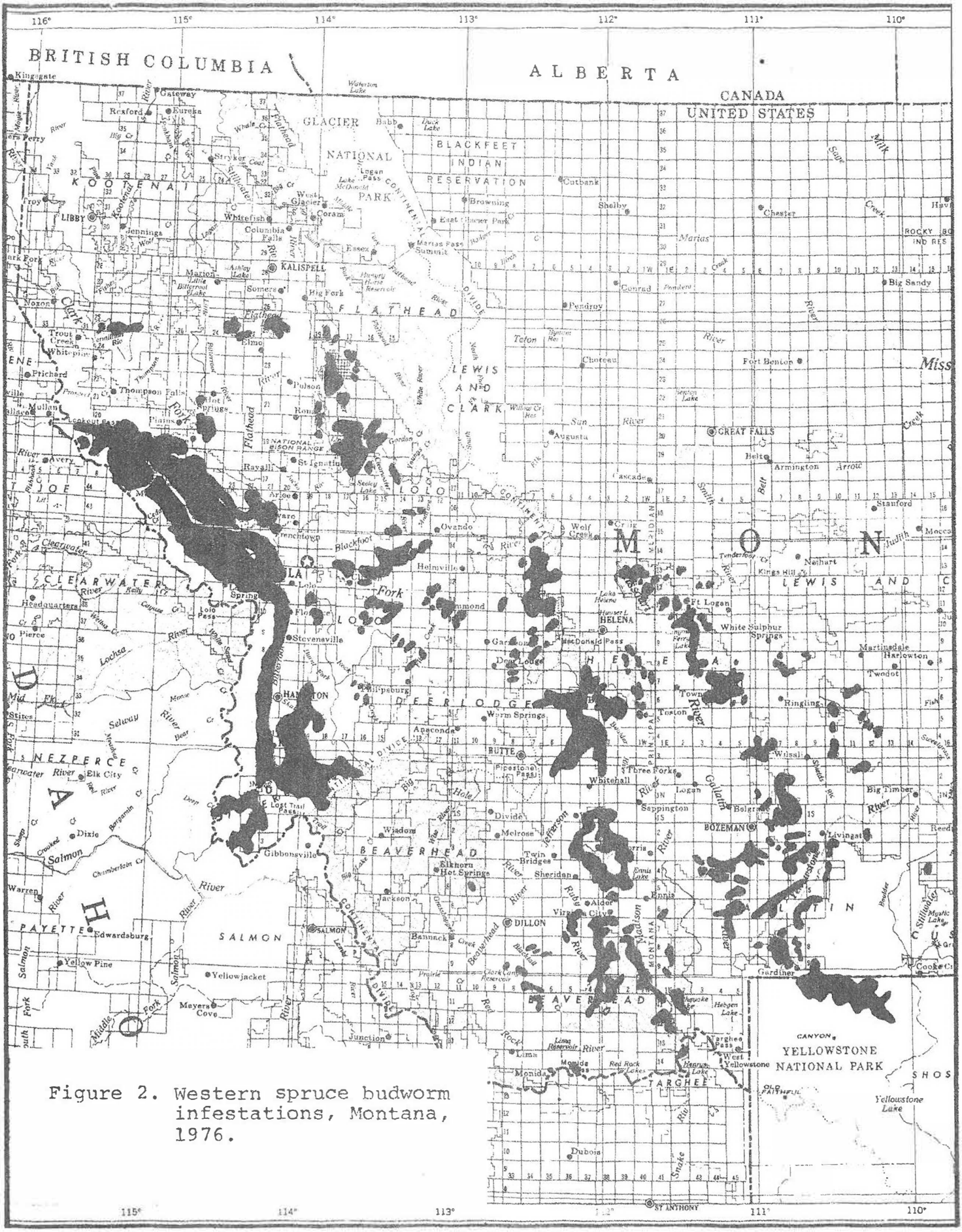
Infestations also continued in 8,500 acres of second-growth ponderosa pine in the Ninemile Creek drainage west of Missoula. Thinning operations on State and Federal lands are continuing in an effort to reduce losses.

DOUGLASFIR BEETLE, Dendroctonus pseudotsugae (Hopk.)

Activity by Douglasfir beetle was generally at low levels in Montana. Infestations consisted of small, scattered groups of overmature Douglasfir.

PINE ENGRAVER BEETLE, Ips sp.

Damage by pine engraver beetles again remained at low levels, probably due to the wet spring and summer weather of 1975 and 1976. Pine engraver beetles continued to kill small ponderosa pines in overstocked stands infested by mountain pine beetles in the Ninemile Creek drainage west of Missoula. Continued awareness of preventive measures in logging and thinning operations on State, private and Federal lands has also reduced the potential for losses to pine engraver beetle.


BRITISH COLUMBIA
ALBERTA
CANADA
UNITED STATES
GLACIER NATIONAL PARK
BLACKFEET INDIAN RESERVATION
KOOTENAI
FLATHEAD
LEWIS AND CLARK
LOLO
DEERLODGE
BEAVERHEAD
MADISON
GALLATIN
PARK
SILVER BOW
CLEARWATER
NEZPERCE
IDAHO
PAYETTE
SALMON
BOISE
MONTANA
YELLOWSTONE NATIONAL PARK
TARGHEE
KALISPELL
LIBBY
MISSOULA
HAMILTON
DILLON
BUTTE
HELENA
GREAT FALLS
BOZEMAN
SALMON
ST ANTHONY
Flathead Lake
Yellowstone Lake
Missoula
Bitterroot
Selway
Lochsa
Clearwater
Salmon
Big Hole
Jefferson
Madison
Gallatin
Yellowstone
Missouri
Marias
Milk
Sun
Teton
Judith
Musselshell
Powder
Stillwater
Big Timber
Livingston
Three Forks
Whitehall
Ennis
Virginia City
Sheridan
Twin Bridges
Melrose
Wisdom
Gibbonsville
Elkhorn Hot Springs
Jackson
Dillon
Lima
Monida
Red Rock Lakes
Dubois
Yellowjack
Yellow Pine
Edwardsburg
Meyers Cove
Junction
Warren
Dixie
Elk City
Pierce
Headquarters
Stites
Orofino
Lewiston
Kingsgate
Eureka
Rexford
Troy
Libby
Whitefish
Columbia Falls
Kalispell
Somers
Marion
Bigfork
Polson
Ronan
St Ignatius
Ravalli
Arlee
Hamilton
Stevensville
Florence
Lolo
Missoula
Frenchtown
Ovando
Helmville
Drummond
Garrison
Deer Lodge
Anaconda
Philipsburg
Warm Springs
Butte
Pipestone Pass
Lost Trail Pass
Big Hole
Divide
Melrose
Twin Bridges
Sheridan
Ennis
Virginia City
Alder
Jackson
Elkhorn Hot Springs
Wisdom
Gibbonsville
Salmon
Bannack
Clark Canyon Reservoir
Red Rock
Lima
Lima Reservoir
Monida
Dubois
Junction
Meyers Cove
Yellowjacket
Yellow Pine
Edwardsburg

Defoliation by western spruce budworm for 1977 has been predicted by the U. S. Forest Service. These predictions were based on egg mass samples from a total of 236 plots in Montana. In general, the Beaverhead National Forest area was predicted for moderate to mostly heavy defoliation; Bitterroot National Forest area - heavy on the west side and moderate on the east side; Deerlodge National Forest area - heavy except Flint Creek area, which was moderate; Flathead National Forest area - light; Gallatin National Forest area - all areas heavy; Helena National Forest area - heavy; Lewis and Clark National Forest area - heavy in the Castle Mountains; Lolo National Forest area - heavy; Kootenai National Forest area - moderate in the Vermillion River area.

A test of four insecticides applied as ground sprays was conducted against western spruce budworm larvae in conjunction with ground spray tests against Douglasfir tussock moth larvae near St. Ignatius. Materials tested were Sevin, Orthene, Pyrocide Growers Spray, and Dimilin. They were applied with hydraulic ground spray equipment to four groups of five infested trees each. All treatments were successful, with percent corrected control ranging from 86 to 100.

LARCH CASEBEARER, Coleophora laricella (Hbn.)

Defoliation from larch casebearer in 1976 was not severe, even in stands at lower elevations, such as those bordering Flathead and Swan Lakes, which have been heavily defoliated in past years. Some light to moderate defoliation occurred on western larch along the west shore of Flathead Lake.

DOUGLASFIR TUSSOCK MOTH, Orgyia pseudotsugata (McD.)

No visible defoliation from Douglasfir tussock moth was detected in Montana in 1976. The single remaining area of high population, a 20 acre spot on State land south of St. Ignatius, collapsed due to the effect of high natural virus levels in the larval population.

The survey began in 1975 to determine the distribution of Douglasfir tussock moth in Montana was continued in 1976. Sticky traps baited with sex attractant pheromone were used to attract and trap adult male moths during the flight period. Traps were placed at 43 locations in the Douglasfir - true fir host type, chiefly east of the Continental Divide. Moths were caught at eight of the locations, extending the known distribution east in the Clark Fork drainage to Bearmouth, and south in the Bitterroot Valley to Piquett Creek in the West Fork drainage. For the first time, Douglasfir tussock moth males were trapped east of the Continental Divide, at two locations near Wolf Creek north of Helena.

An additional study, using pheromone-baited sticky traps, was also conducted as part of a west-wide program to refine and standardize pheromone trapping techniques and to develop methods to assess field populations from pheromone trap catches. Ten plots in the Missoula and Flathead Valley areas were used, and grids of 30 traps with different pheromone bait concentrations were placed at each plot. The study will be continued in 1977, and hopefully, will lead to a method

by which pheromone-baited sticky traps can be used to monitor field populations of Douglasfir tussock moth. By relating number of moths trapped to increases in population levels, outbreaks in a given area could be predicted in time to gear up for possible control action.

Before the larval populations near St. Ignatius collapsed due to the effect of the natural virus levels, four insecticides (Sevin, Orthene, Pyrocide Growers Spray and Dimilin) were tested against first instar larvae. The insecticides were applied with hydraulic ground spray equipment to four groups of five infested trees each. All treatments were highly successful, with all materials giving 100 percent corrected control.

FOREST TENT CATERPILLAR, Malacosoma disstria (Hbn.)

The forest tent caterpillar outbreak in about 2,000 acres of cottonwoods, aspen and other deciduous trees and shrubs between Evaro and Arlee and along Finley Creek that caused heavy defoliation in 1975 virtually collapsed in 1976, with very little defoliation being observed. Collapse was due mainly to high levels of natural virus infection in the larval population.

Forest tent caterpillar defoliation occurred on about 800 acres of cottonwood near the south end of Swan Lake. Severe tree damage did not result, and the trees refoliated following larval feeding. Additional defoliation may occur in 1977.

Cone and Seed Insects

Although several cone and seed insects caused damage in Montana during the year, western spruce budworm continued to be the most serious pest of Douglasfir cone crops. The amount of seed produced for natural regeneration was greatly reduced in many areas.